

University
9-1-38

CONTENTS.

PAPERS.

NO.	MONTH.		PAGE.
393	(July.)	Preliminary Report of the Committee on the Proper Relation to each other of the Sections of Railway Wheels and Rails. Presented at the Annual Convention, June 29, 1888.....	1
394	(August.)	The Canadian Pacific Railway: Annual Address. Read at the Convention of the Society, Milwaukee, Wis., June 28, 1888.— THOMAS C. KEEFER.....	55
395	(September.)	Some Facts in Relation to Friction, Waste and Loss of Water in Mains. Read at the Annual Convention, June 28, 1888.— CHARLES B. BRUSH.....	89
....	(do.)	Discussion on Water Mains and Meters: By G. H. BENZENBERG..... By JAMES B. FRANCIS..... By C. B. BRUSH..... By J. W. WESTON..... By T. J. WHITMAN..... By J. FOSTER CROWELL..... By C. F. LOWETH..... By C. E. GOAD..... By J. T. FANNING..... By A. FTELEY..... By MANSFIELD MERRIMAN..... By OBERLIN SMITH..... By G. W. PEARSONS..... By L. L. TRIBUS.....	106, 110, 119 106 107, 108, 109, 110, 117, 118, 120 107 108 109 109 110 110, 119 116 117 117 118 124
396	(October.)	The Theory of Aqua Ammonia Engines, with results of Tests upon an Engine of this Type operating an Edison Incandescent Lighting Plant. Read September 5th, 1888.— EDWARD E. MAGOVERN.....	127
397	(do.)	High Walls or Dams to resist the Pressure of Water. Read May 16th, 1888.— JAMES B. FRANCIS.....	147

IV

NO.	MONTH.		PAGE.
....	(October.)	Discussion on High Dams :	
		By EDWARD WEGMANN, JR.....	171, 177
		By A. FTELEY.....	176, 177, 198
		By THEODORE COOPER.....	177
		By JAMES B. FRANCIS.....	178, 179, 180, 198, 199
		By CHARLES E. EMERY.....	178
		By H. W. BRINCKERHOFF.....	179
		By GEORGE S. GREENE.....	180
		By G. BOUSCAREN.....	181
		By J. P. FRIZELL.....	184
		By E. SHERMAN GOULD.....	185
		By W. W. MACLAY.....	188
		By F. COLLINGWOOD.....	188
		By E. A. FUERTES.....	190
		By JOHN W. HILL.....	192
		By N. M. EDWARDS.....	199
398	(November.)	The Construction of the Sweetwater Dam.	
		Read October 17, 1888.—	
		JAMES D. SCHUYLER.....	201
....	(do.)	Discussion on Sweetwater Dam :	
		By JAMES B. FRANCIS.....	219, 227
		By H. W. BRINCKERHOFF.....	219, 228
		By JAMES D. SCHUYLER.....	219, 221, 222, 229, 231
		By E. WEGMANN, JR.....	219, 220, 221, 222, 225, 226, 230
		By W. B. PARSONS.....	220, 221
		By J. J. R. CROES.....	221, 222, 226, 228, 231
		By L. L. BUCK.....	222
		By A. FTELEY.....	226, 227
		By C. B. COMSTOCK.....	227, 229
		By THEODORE COOPER.....	228, 229, 230
		By CHARLES W. HUNT.....	231
399	(do.)	Some Observations on the Subject of the Improvement of Several of the Rivers of the Atlantic Coast.	
		Read at the Annual Convention, June 28, 1888.—	
		W. P. CRAIGHILL.....	233
....	(do.)	Discussion on Improvement of Rivers :	
		By F. COLLINGWOOD.....	253
		By C. P. E. BURGWIN.....	254, 271
		By O. M. CARTER.....	257
		By WILLIAM H. BIXBY.....	259
		By WILLIAM R. HUTTON.....	267, 272
400	(December.)	Plant and Material of the Panama Canal.	
		Read at the Annual Convention, July 2, 1888.—	
		WILLIAM PLUMB WILLIAMS.....	273
401	(do.)	New Transfer Bridge, Harsimus Cove, Jersey City, N. J.	
		Read October 3, 1888.—	
		J. A. BENSEL.....	309
....	(do.)	Discussion on Transfer Bridge :	
		By J. J. R. CROES.....	310
		By J. A. BENSEL.....	310
		By JOHN BOGART.....	310
		By THEODORE COOPER.....	310

V

ILLUSTRATIONS.

PLATE.	MONTH.		PAPER.	PAGE.
....	(July.)	Fifteen Figures illustrating Report on Railway Wheels and Rails.....	393	
I.	(August.)	General Map of the Line of the Canadian Pacific Rail- way.....	394	55
II.	(do.)	Interior View of Snow Shed.....	394	68
III.	(do.)	Overflow of Avalanche before construction of Glance Fences.....	394	70
IV.	(do.)	Snow Cut, Summit of Selkirks, before Extension of Shed.....	394	72
V.	(do.)	Map of Line between Beaver Station and Craigel- lachie, showing Location of Snow Sheds.....	394	88
VI.	(do.)	Topographical Map of the Line in the Vicinity of the Summit of the Selkirks.....	394	88
VII.	(do.)	Profile of Line between Calgary and Sicamous, Show- ing all Heavy Grades between the Atlantic and Pacific, and also the Location of Snow Sheds.....	394	88
VIII.	(do.)	Plan of Standard Divisional Yard.....	394	88
IX.	(do.)	The Various Types of Snow Sheds, Glance Fence, and Split Fence: also Consolidation Engine, Tender and Snow Plough.....	394	88
....	(do.)	Cut showing Method of blasting Snow Slide.....	394	71
....	(do.)	Cut showing Excavation of Snow Slide filled with trees.....	394	72
....	(do.)	Cut showing Method of treating "Gumbo Cuts"....	394	74
X.	(September.)	Comparison of Hourly Draft of Water at Hoboken, for weeks ending February 24 and August 4, 1883, the waste being reduced between those dates....	395	96
XI.	(do.)	Diagram of Co-efficients of Flow in Pipes Under Pressure.....	395	112
XII.	(do.)	Flow and Friction Losses in Water Pipes in a Section of St. Paul, Minn.....	395	114
XIII.	(do.)	Diagram of Flow in Pipes under Pressure.....	395	124
XIV.	(do.)	Diagram of Flow in Pipes under Pressure.....	395	124
XV.	(October.)	Ground Plan, Aqua Ammonia Engine.....	396	137
XVI.	(do.)	Boiler Setting, Aqua Ammonia Engine.....	396	141
XVII.	(do.)	Indicator Cards, Aqua Ammonia Engine.....	396	145
XVIII.	(do.)	Illustration of paper on High Walls or Dams to resist the Pressure of Water.....	397	170
XIX.	(do.)	Illustration of Paper on High Walls or Dams to resist the Pressure of Water.....	397	170
XX.	(do.)	Illustration of Paper on High Walls or Dams to resist the Pressure of Water.....	397	170
XXI.	(do.)	Cuts Illustrating Discussion by G. BOUSCAREN.....	397	183
XXII.	(do.)	Findlay Dam, Illustrating Discussion by J. W. HILL.....	397	197
XXIII.	(November.)	Front View Sweetwater Dam.....	398	202
XXIV.	(do.)	Rear View Sweetwater Dam.....	398	204
XXV.	(do.)	Sweetwater Dam from Lower End of Waste-way....	398	208
XXVI.	(do.)	Waste Weir, Sweetwater Dam.....	398	212
XXVII.	(do.)	Tower and Inlet, Sweetwater Dam.....	398	214
XXVIII.	(do.)	Plan of Sweetwater Dam.....	398	218
XXIX.	(do.)	Elevation of Sweetwater Dam, and Plan of Waste Weir	398	218
XXX.	(do.)	Profile of Sweetwater Dam, and Section of Conduit..	398	218
XXXI.	(do.)	Map of San Diego Bay Region, Showing Location of Sweetwater Dam and Reservoir, and the District Commanded by its Pipe Lines.....	398	218

VI

PLATE.	MONTH.		PAPER.	PAGE.
XXXII.	(November.)	View of Bear Valley Dam, Illustrating Discussion by J. D. SCHUYLER	398	222
XXXIII.	(do.)	Section of Bear Valley Dam, Illustrating Discussion by J. D. SCHUYLER.....	398	223.
XXXIV.	(do.)	Patapsco River and Baltimore Harbor.....	399	252
XXXV.	(do.)	James River from Richmond to Jones' Neck.....	399	252
XXXVI.	(do.)	Profile of James River from Richmond to the Sea....	399	252
XXXVII.	(do.)	James River from Richmond to Falling Creek.....	399	252
XXXVIII.	(do.)	Appomattox River.....	399	252
XXXIX.	(do.)	Pocomoke River.....	399	252
XL.	(do.)	Wicomico River.....	399	252
XLI.	(do.)	Cape Fear River, illustrating discussion by W. H. BIXBY	399	266
XLII.	(December.)	American Hercules Dredge, "City of Paris".....	400	274
XLIII.	(do.)	American Hercules Dredge, Working Eight Meters above Sea-Level	400	276
XLIV.	(do.)	Scotch Dredge.....	400	280
XLV.	(do.)	French Dredge.....	400	282
XLVI.	(do.)	French Dredge with Long Discharge Pipe.....	400	284
XLVII.	(do.)	Belgian Dredge.....	400	286
XLVIII.	(do)	Rail Section used in Construction Work, Panama Canal.....	400	291
XLIX.	(do.)	De Cauville System of Pan Cars.....	400	292
L.	(do.)	French and English Cranes.....	400	294
LI.	(do.)	Crane and Bucket System at Obispo.....	400	294
LII.	(do.)	Rock Cut, Showing System of Churn Drills and Crane Buckets	400	294
LIII.	(do.)	French Excavator, "Down Digger" type.....	400	296
LIV.	(do.)	Osgood American Excavator	400	296
LV.	(do.)	French Excavator, "Up Digger" type.....	400	298
LVI.	(do.)	Excavator and Transporter.....	400	298
LVII.	(do.)	Paraiso Section; French and American Excavators at Work.....	400	298
LVIII.	(do.)	Rock Cut at Obispo: Everard Dump Cars.....	400	300
LIX.	(do.)	Profile of Panama Canal.....	400	302
LX.	(do.)	Section of Canal near Colon, Excavated in Low Ground.....	400	304
LXI.	(do.)	Culebra Cut.....	400	306
LXII.	(do.)	Culebra Cut, Panama Side.....	400	306
LXIII.	(do.)	Culebra Cut, Colon Side.....	400	306
LXIV.	(do.)	Cut at Emperador.....	400	308
LXV.	(do.)	Machine Shops at Emperador.....	400	308
LXVI.	(do.)	Transfer Bridge for Cars, Harsimus Cove.....	401	312
LXVII.	(do.)	do do do do	401	312

ERRATA.

Vol. XIX, September, 1888, page 109, eleventh line from the bottom, "page 13" should read "page 103."

NOTE.—In the Transactions for September, 1888, Vol. XIX, page 92, Table No. 2, and also on Plate XIII, page 124, reference is made to data from tables published by the Cincinnati and Newport Pipe Co. We are now informed that these tables were originally prepared by Messrs. A. H. Howland and George A. Ellis, Civil Engineers.

